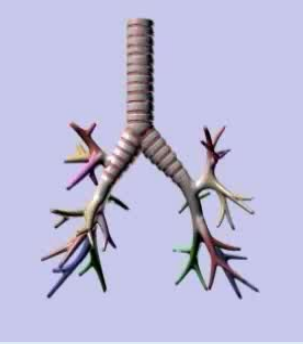

The role of valvular bronchoblocation in the complex management of pulmonary tuberculosis

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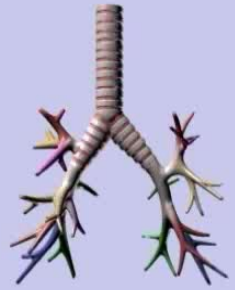
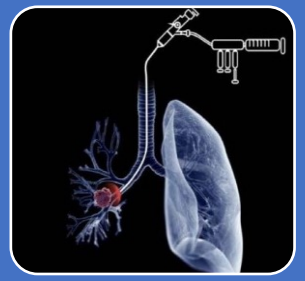
MD Teona Mskhaladze
National Center for Tuberculosis and Lung Diseases
Tbilisi State Medical University

2024

Interventional pulmonology

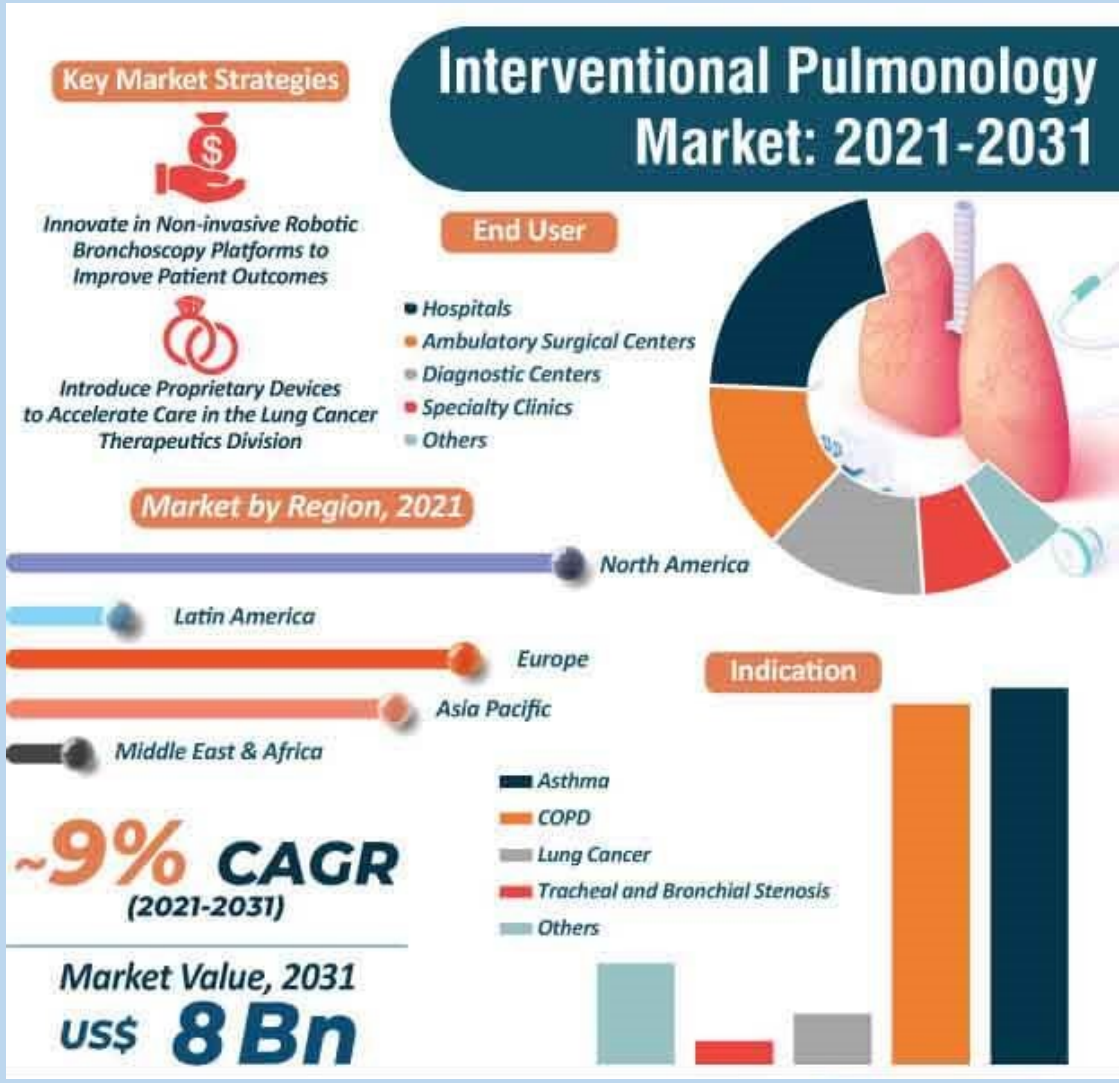




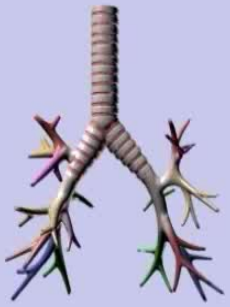
Interventional pulmonology is an effective method for managing severe and uncontrolled diseases of the respiratory system when medical treatment is ineffective and surgical treatment is contraindicated.

One of the areas of interventional pulmonology is valvular bronchoblocation, which has been approved by the FDA for lung volume reduction in patients with severe emphysema and COPD.

In recent years, valvular bronchoblocation has been used in both Asian and European countries for destructive forms of pulmonary tuberculosis.



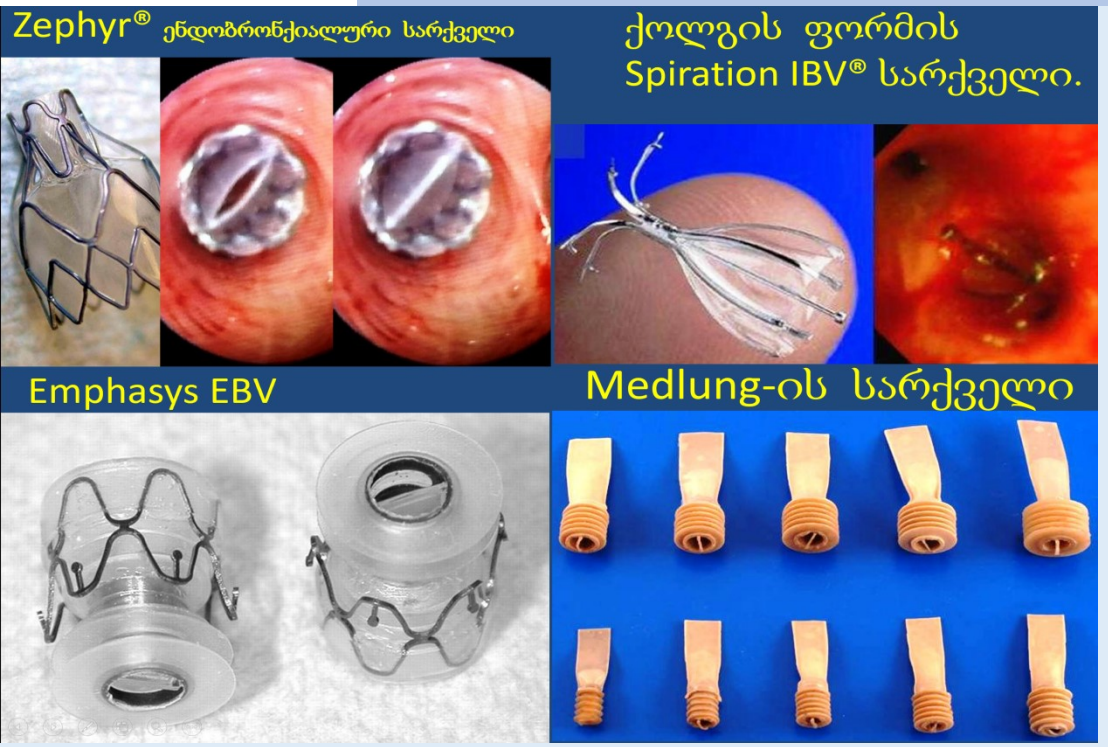
Valvular bronchoblocation in the complex management of pulmonary tuberculosis

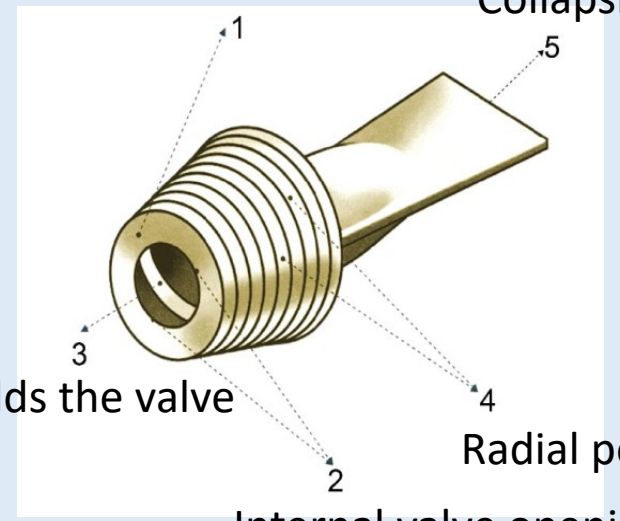


As a result of the successful use of valve bronchial occlusion in Georgia, this method was included in the new national tuberculosis management guidelines in 2021 and funded by a state program as a separate treatment component.

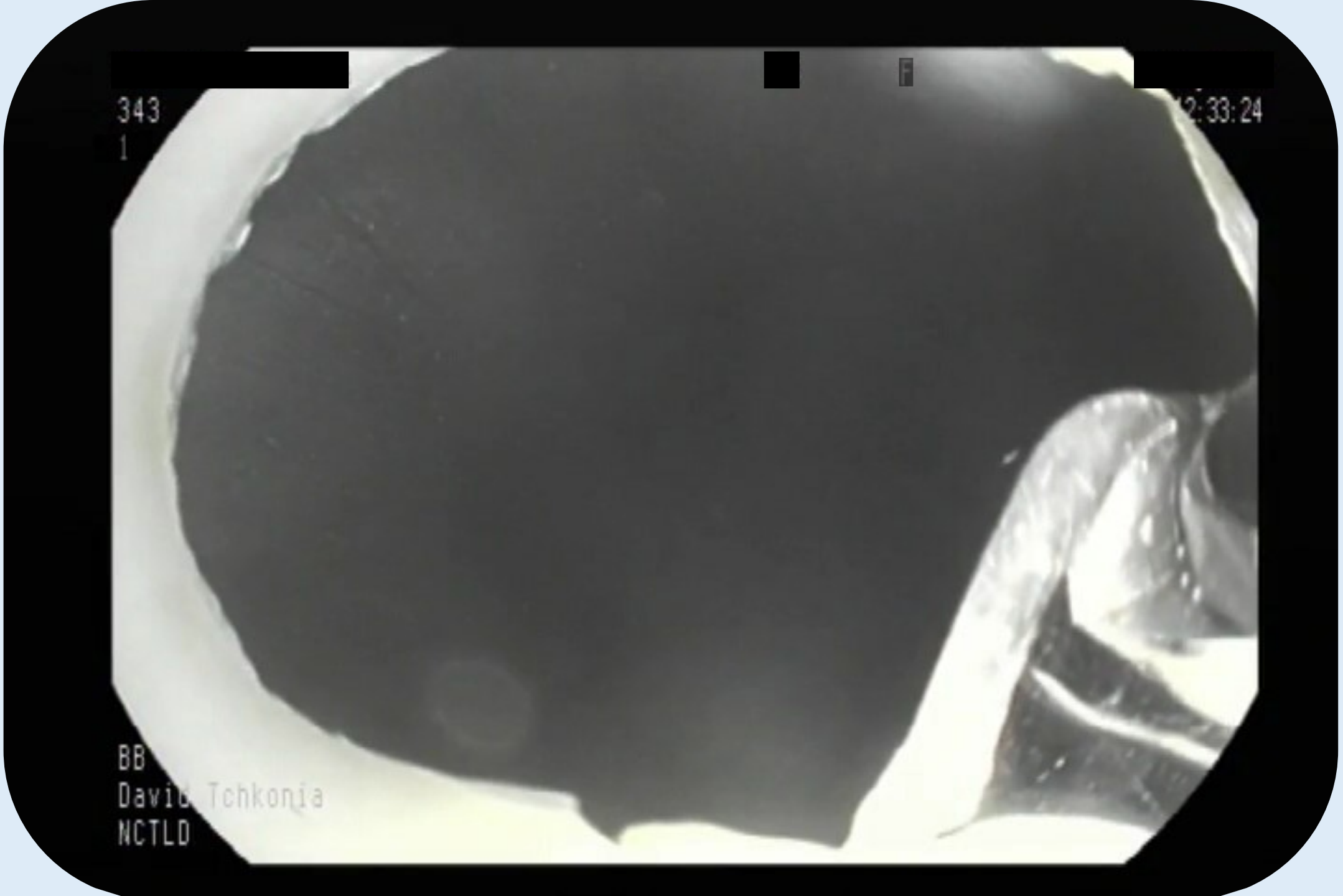
Method of Valvular Bronchoblocation

Endobronchial Valves



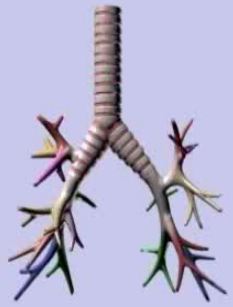


Design of the endobronchial valve


343
1
F
2:33:24
BB
David Tchkonia
NCTLD


544
1
11:58:42
Extraction
David Tchkonia
NCTLD

Indications and Contraindications for the Valvular Bronchoblocation



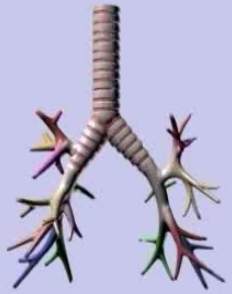
Indications

1. Bleeding from the respiratory tract
2. Emphysema
3. Pneumothorax
4. Broncho-pleural fistula

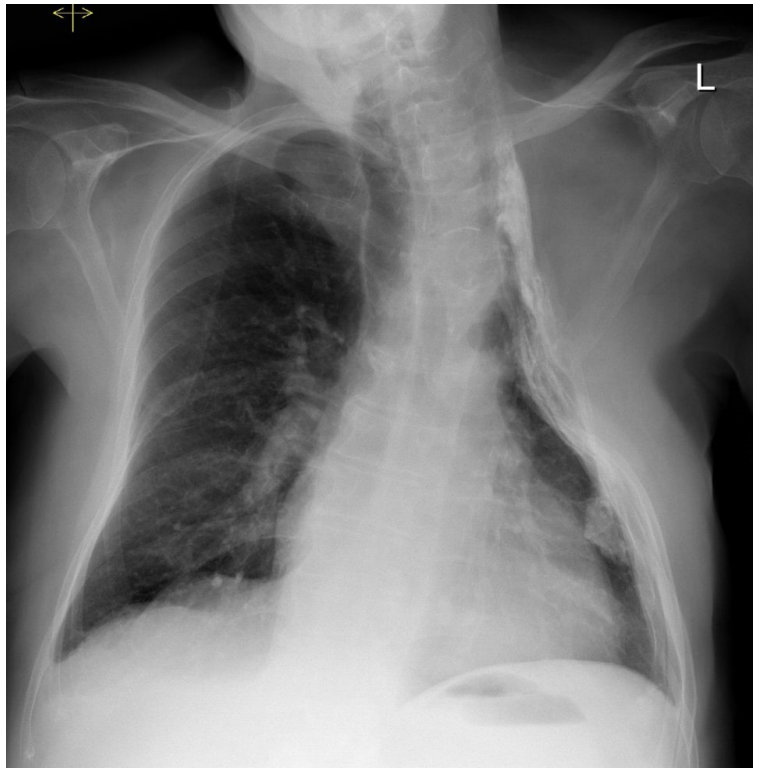
Contraindications

1. Purulent endobronchitis
2. Bronchiectasis
3. Acute cardiovascular failure
4. Malignant tumor

Collapse Therapy



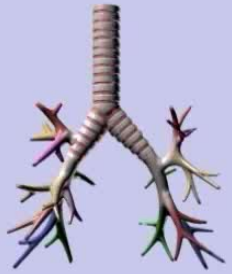
Thoracoplasty



Pneumoperitoneum

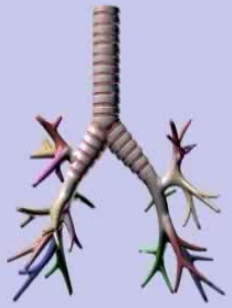
Bronchoblocation

Statistics of pulmonary tuberculosis in Georgia 2023



- A total of 1,448 TB cases were reported;
- 1144 A new case and 304 Relapse;
- 8.9% of new cases and 24% of previously treated cases were resistant tuberculosis. The effectiveness of the treatment of resistant forms does not exceed 75%.
- Mortality was observed: 4% of sensitive patients; 6% of resistant patients.

Valvular Bronchoblocation Research conducted at the National Center for Tuberculosis and Lung Diseases

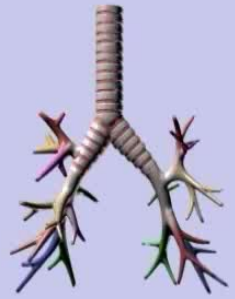


- Pulmonary tuberculosis is a significant public health problem both in the world and in Georgia. Despite the inclusion of new drugs in the treatment regimens for resistant tuberculosis, resistance to these drugs has already been observed;

- The results of the treatment of pulmonary tuberculosis are still unexplored and remain an important problem for WHO;

- Long-term studies have shown that mortality after transmission of pulmonary tuberculosis is much higher than in the general population;

Study Patients

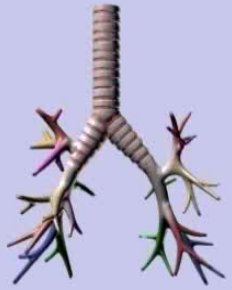


Total: 190 patients with pulmonary tuberculosis

Study Group n=65
Conservative treatment and Valve bronchoblocation

Control Group n=125
Conservative treatment

Diagnostic Methods



Chest X-ray

- before starting treatment
- The end of the intensive phase
- At the end of the treatment

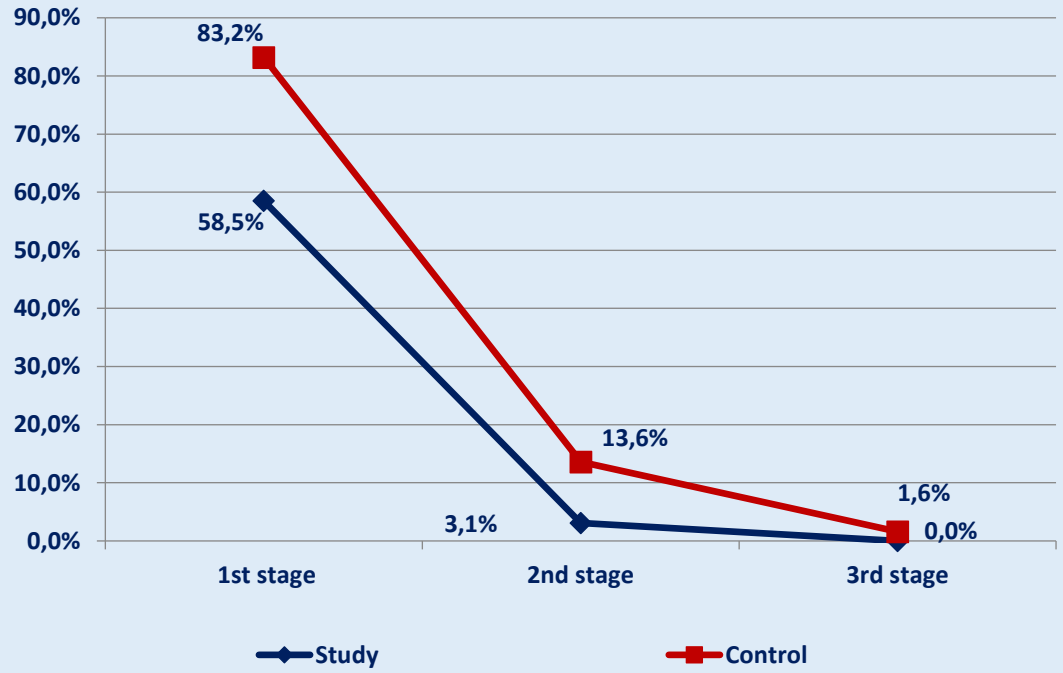
Bacteriological analysis of sputum, clinical and biochemical blood analysis

- before starting treatment
- 1 month later
- The end of the intensive phase
- At the end of the treatment

Study Results

Results of X-ray examination

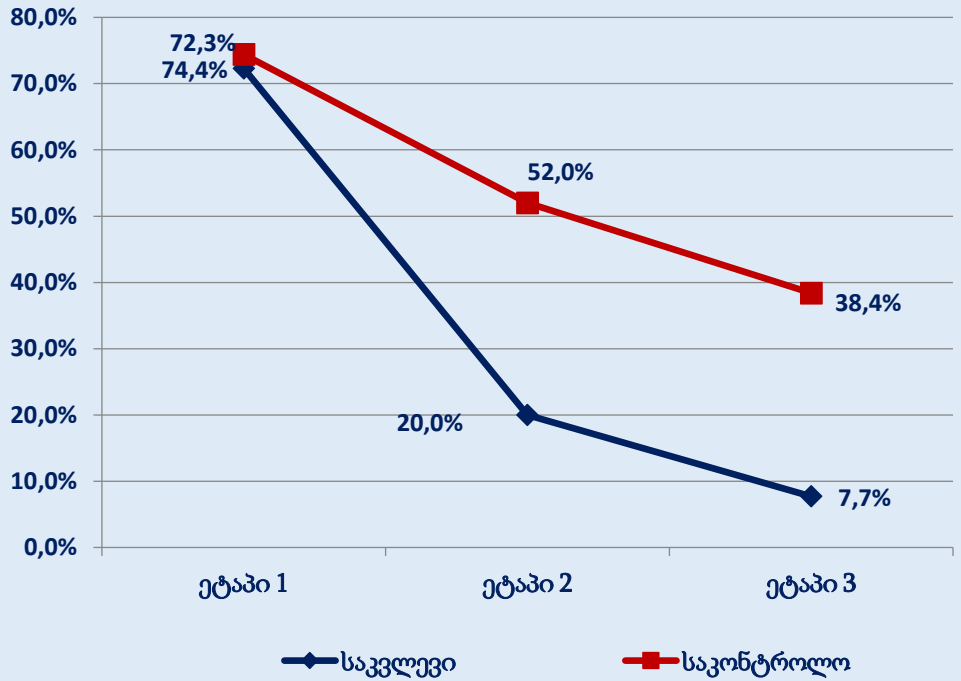
Infiltration



2 vs. 1 – Chi2- test = 46.44; p<0.001

2 vs. 1 – Chi2- test = 120.04; p<0.001

cavitation



2 vs. 1 - Chi2- test = 21.50; p<0.001

2 vs. 1 - Chi2- test = 10.57; p<0.001

stady vs. control - Chi2-test=18.00, p<0.001

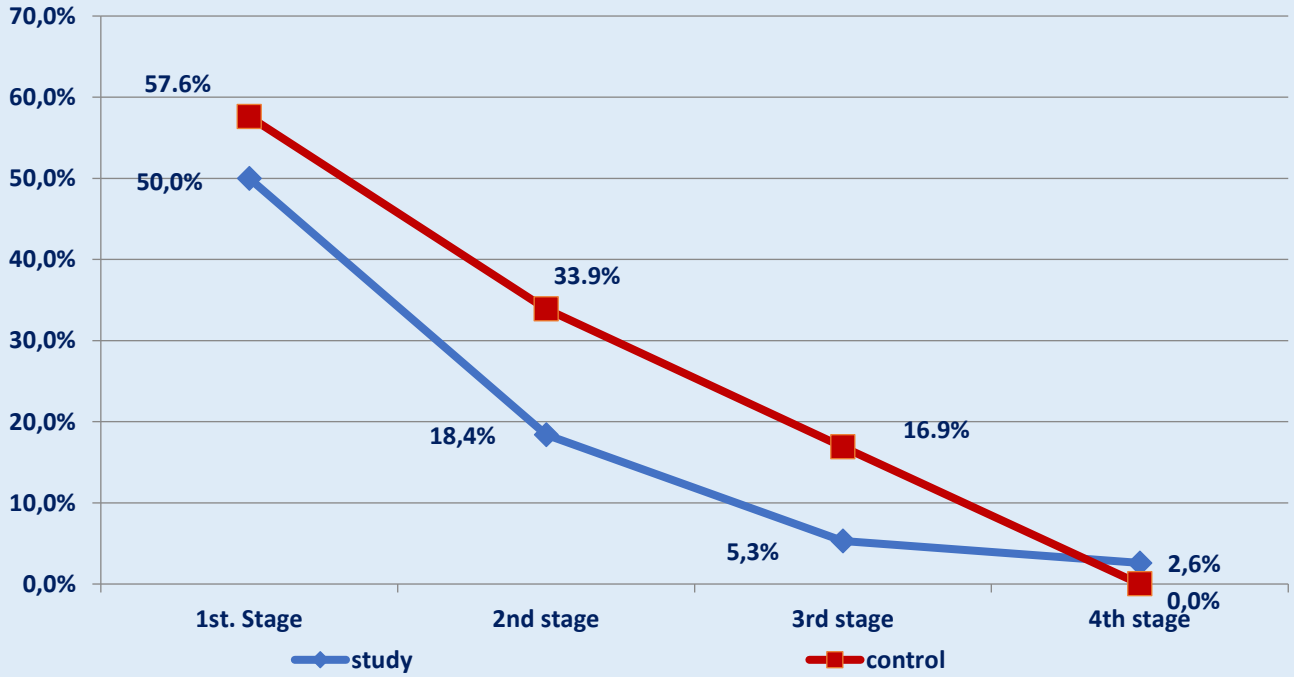
3 vs. ეტაპი 2- Chi2- test = 4.10; p=0.043

3 vs. ეტაპი 2 - Chi2- test = 4.65; p=0.031

stady vs. control - Chi2-test=19.94, p<0.001

Study Results

Dynamics of the results of bacterioscopic examination of sputum by stages of the study in the main and control groups



44.1±23.2 day

63.3±25.2 day

Stage 2 vs. Stage 1 - Chi2- test = 5.61; p=0.018

Stage 3 vs. Stage 2 - Chi2- test = 2.46; p=0.117

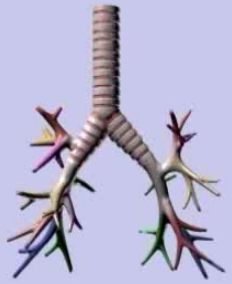
Stage 4 vs. Stage 3 - Chi2- test = 0.21; p=0.650

Stage 2 vs. Stage 1 - Chi2- test = 12.73; p<0.001

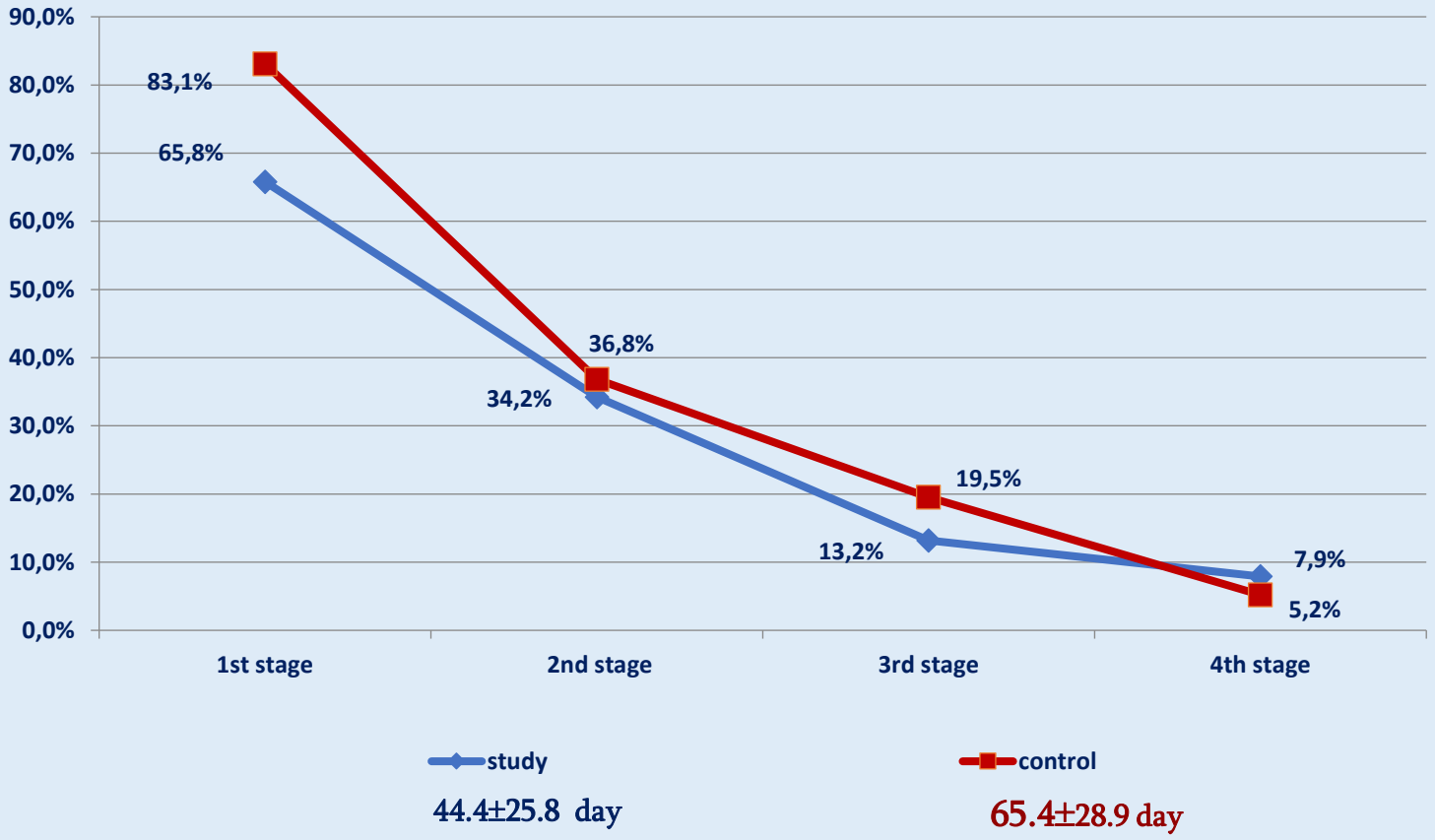
Stage 3 vs. Stage 2 - Chi2- test = 8.74; p=0.008

Stage 4 vs. Stage 3 - Chi2- test = 21.65; p<0.001

Study Results



Dynamics of sputum cultural research results according to research stages in research and control groups



44.4±25.8 day

65.4±28.9 day

2 vs. 1 - Chi2- test = 8.89; p=0.002

3 vs. 2 - Chi2- test = 3.46; p=0.021

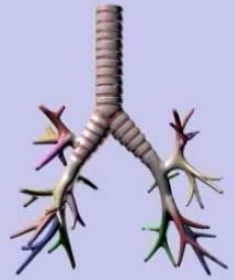
4 vs. 3 - Chi2- test = 0.61; p=0.443

2 vs. 1 - Chi2- test = 16.81; p<0.001

3 vs. 2 - Chi2- test = 11.53; p<0.001

4 vs. 3 - Chi2- test = 7.53; p=0.003

Study Results



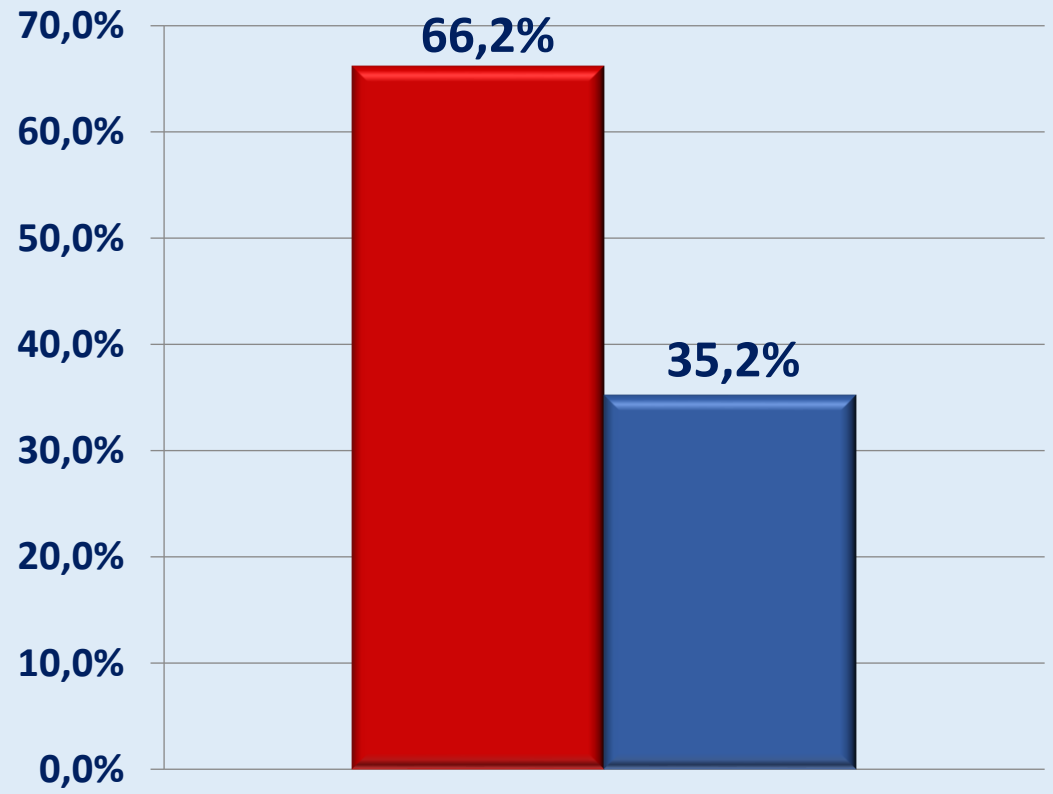
The treatment outcomes in the study and control groups

#	Treatment outcomes	Study group (n=65)	Control group (n=125)
1	Cure	57 (87.7%)	107 (85.6%)
2	Death	3 (4.6%)	9 (7.2%)
3	Without result	2 (3.1%)	0 (0.0%)
4	Unknown	3 (4.6%)	9 (7.2%)

Cure OR = 0.72; 95%CI – 0.37-1.39

Study Results

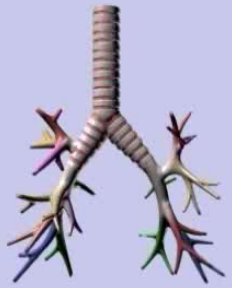
number of patients



OR=3.77, 95%CI – 2.00-7.13, p<0.001

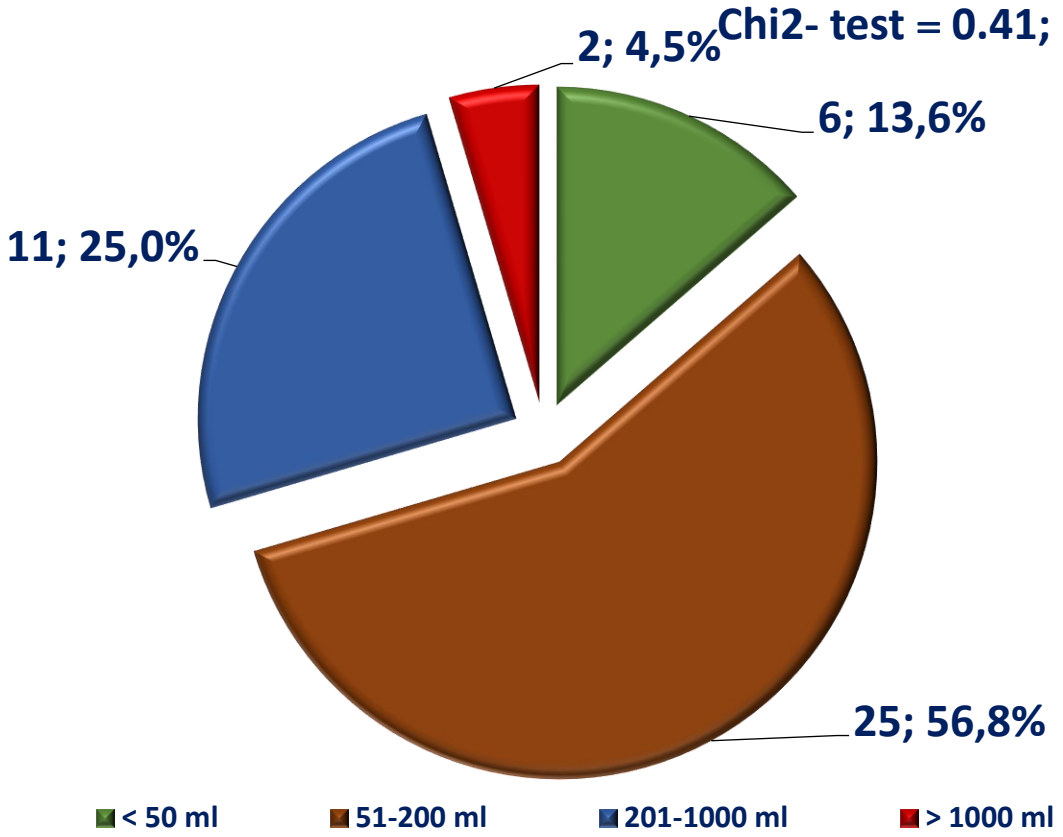
Study Results

Comparison of treatment effects during bleeding

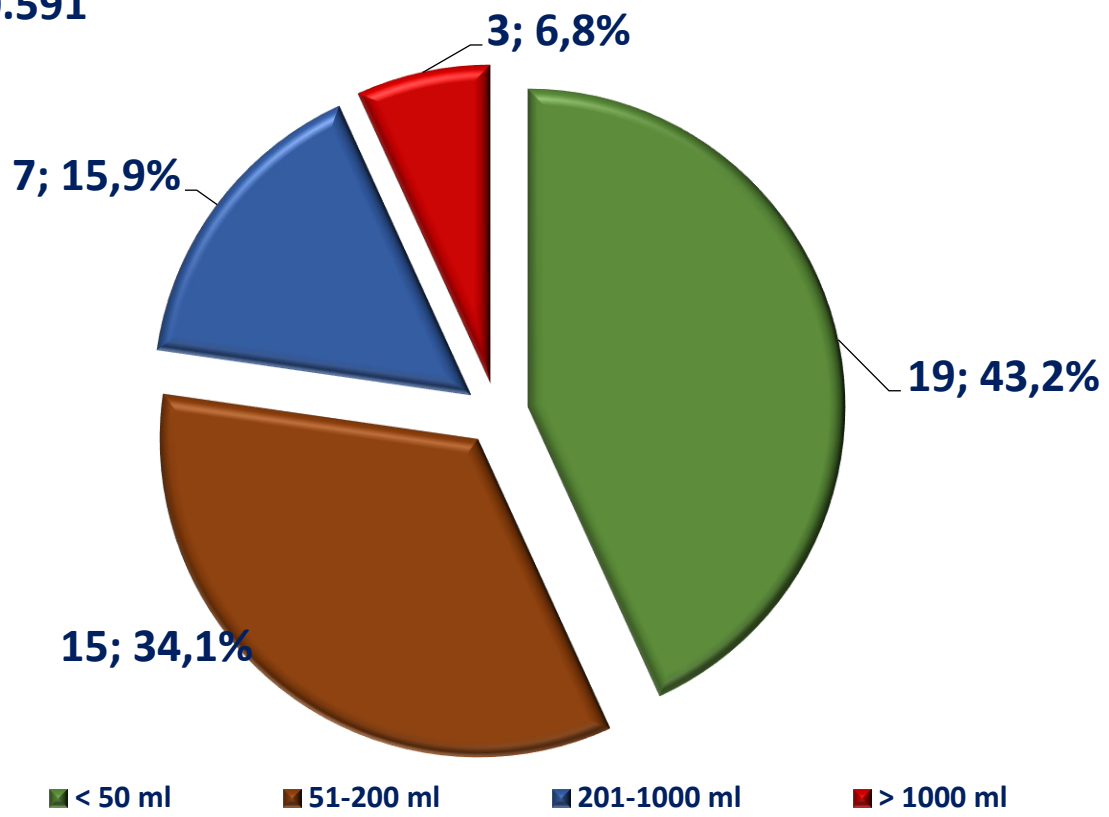


Study Subgroup

Chi2- test = 0.41; p=0.591

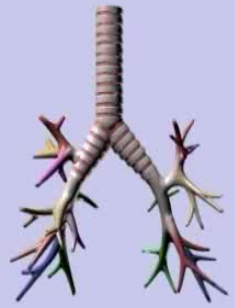


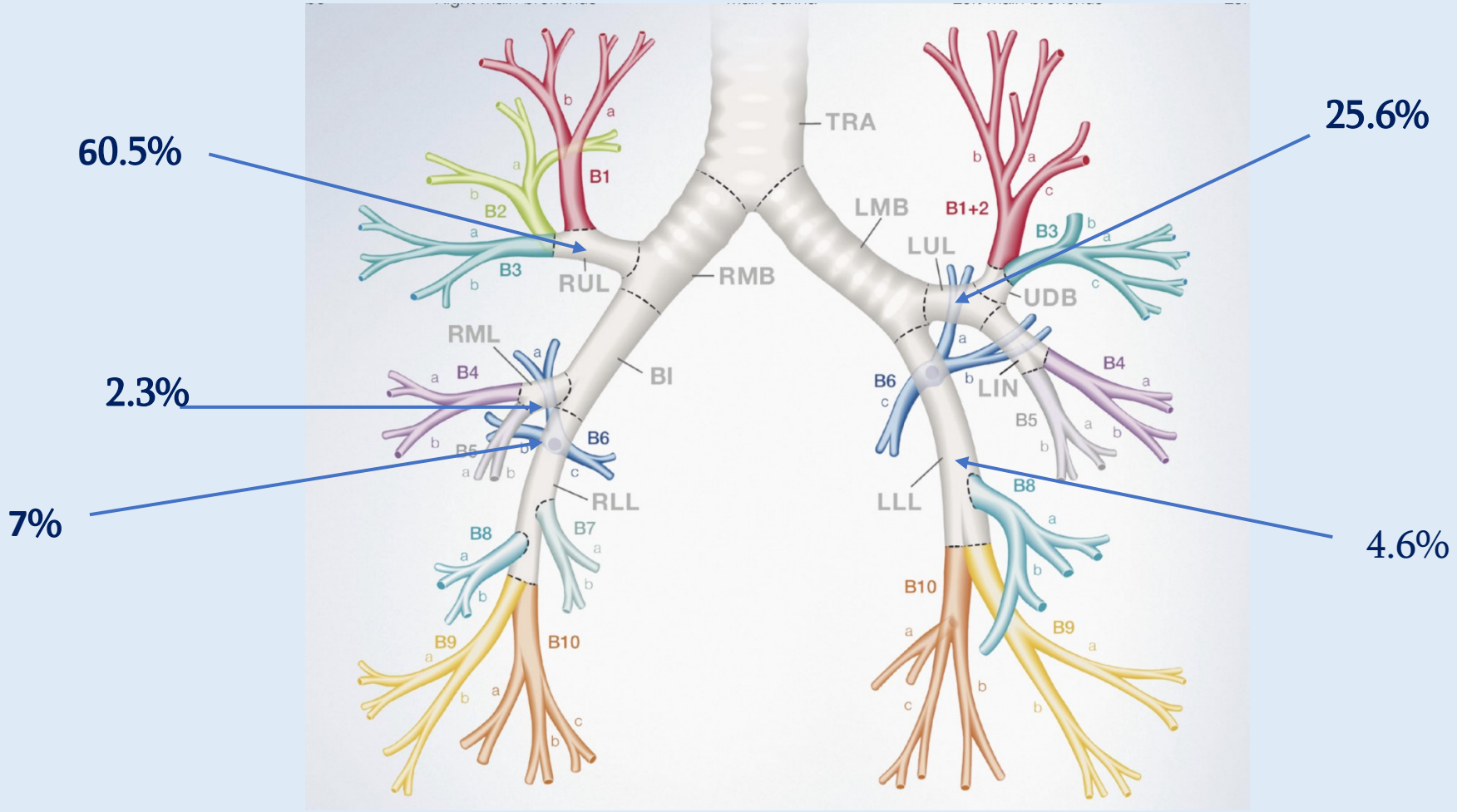
Control Subgroup



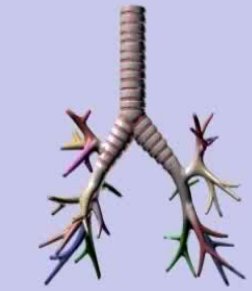
Study Results

Bleeding Bronchus

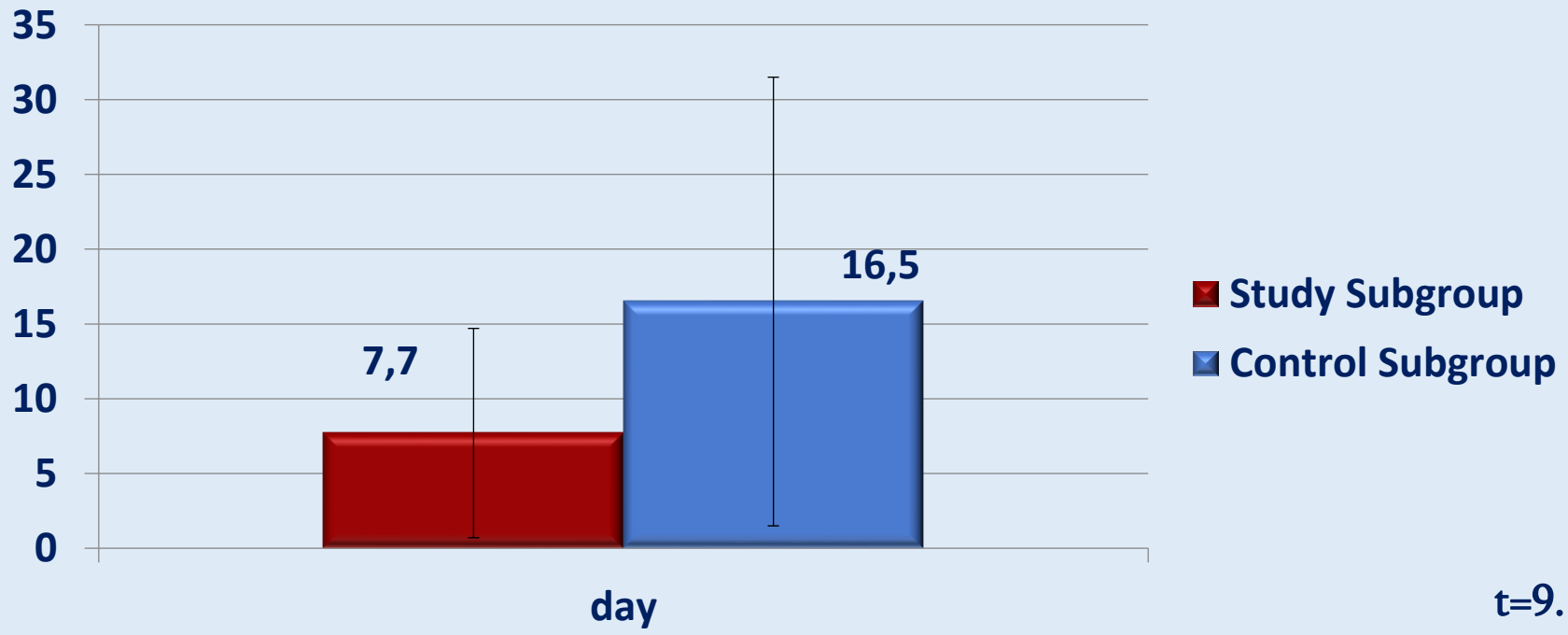




Study Results



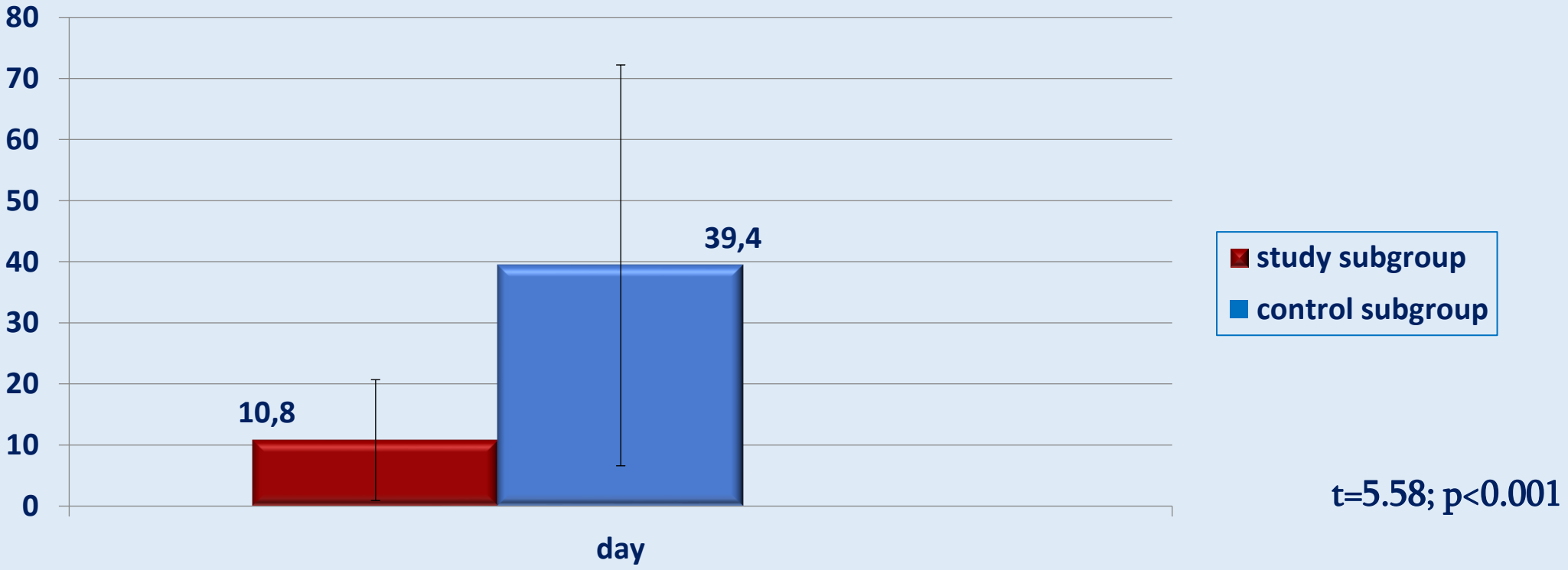
Time to achieve hemostasis



t=9.10; p<0.001

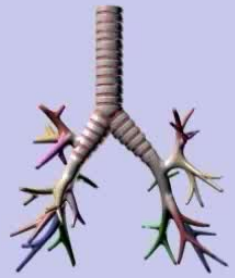
Study Results

Terms of hospitalization



t=5.58; p<0.001

Study Results



The treatment outcomes in the study and control subgroups

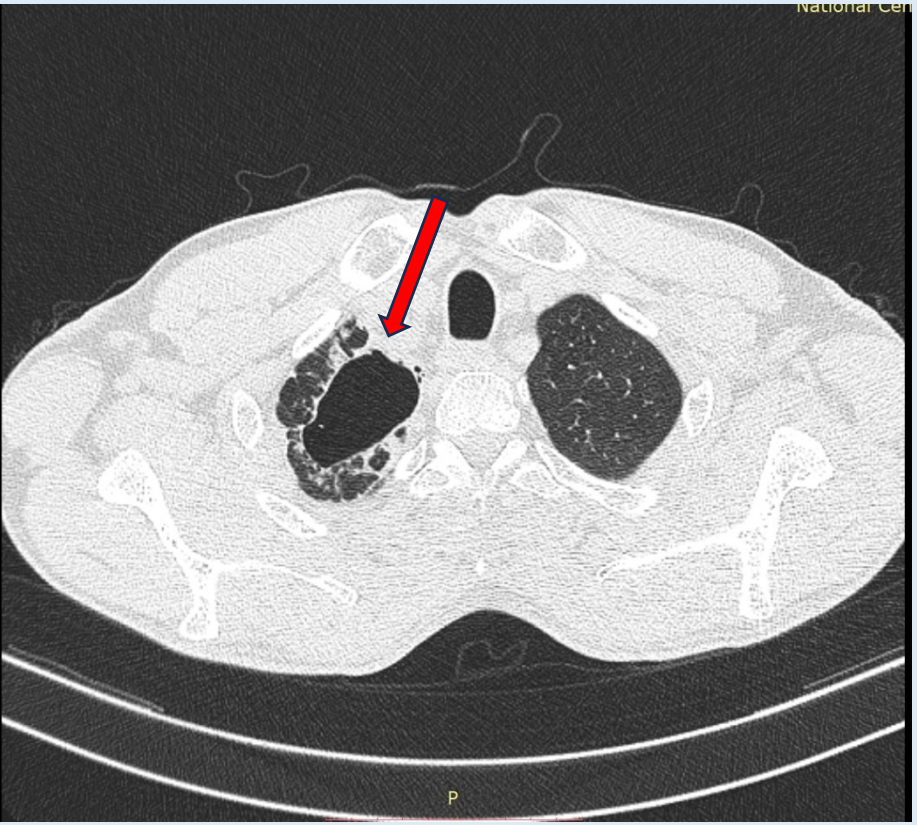
#	Treatment outcomes	Study group (n=43)	Control group (n=44)
1	Cure	39 (90.7%)	25 (56.8%)
2	Death	2 (4.7%)	9 (20.5%)
3	Surgery	2 (4.7%)	10 (22.7%)

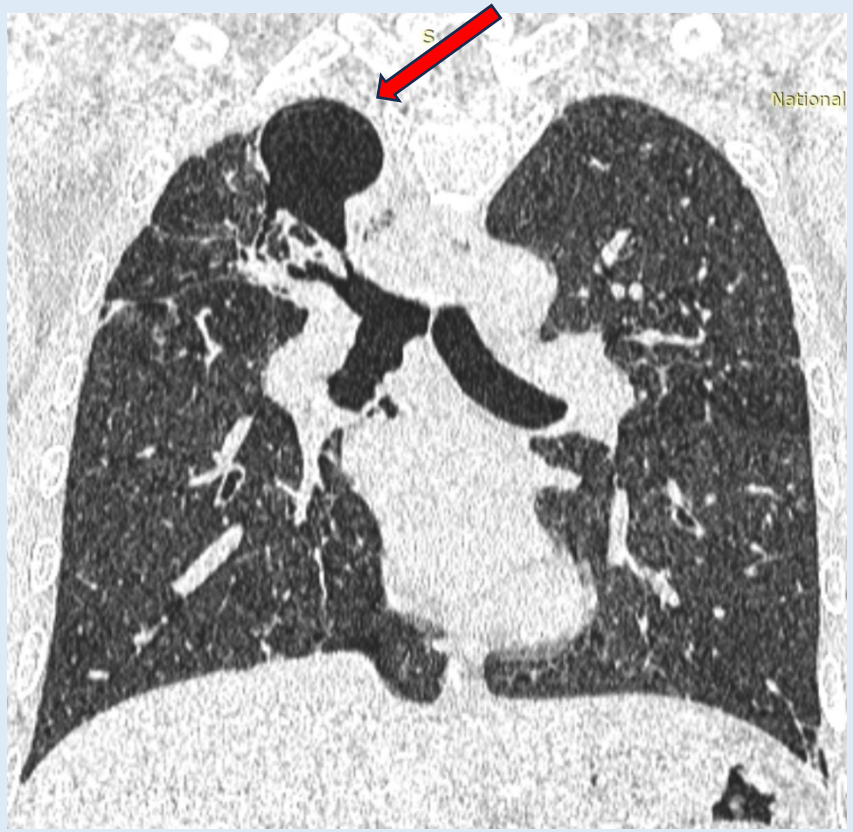
Cure - OR = 4.34; 95%CI – 1.72-10.96; p=0.002

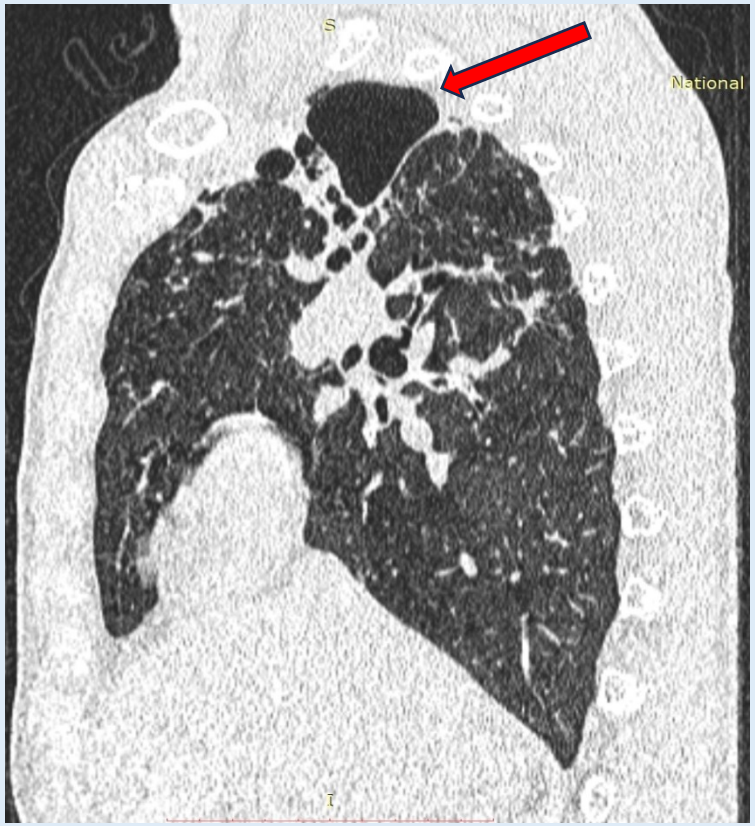
Death- OR =5.27; 95%CI – 1.07-26.04; p=0.041

Surgery- OR = 7.41; 95%CI – 2.25-24.34; p=0.001

Case N1

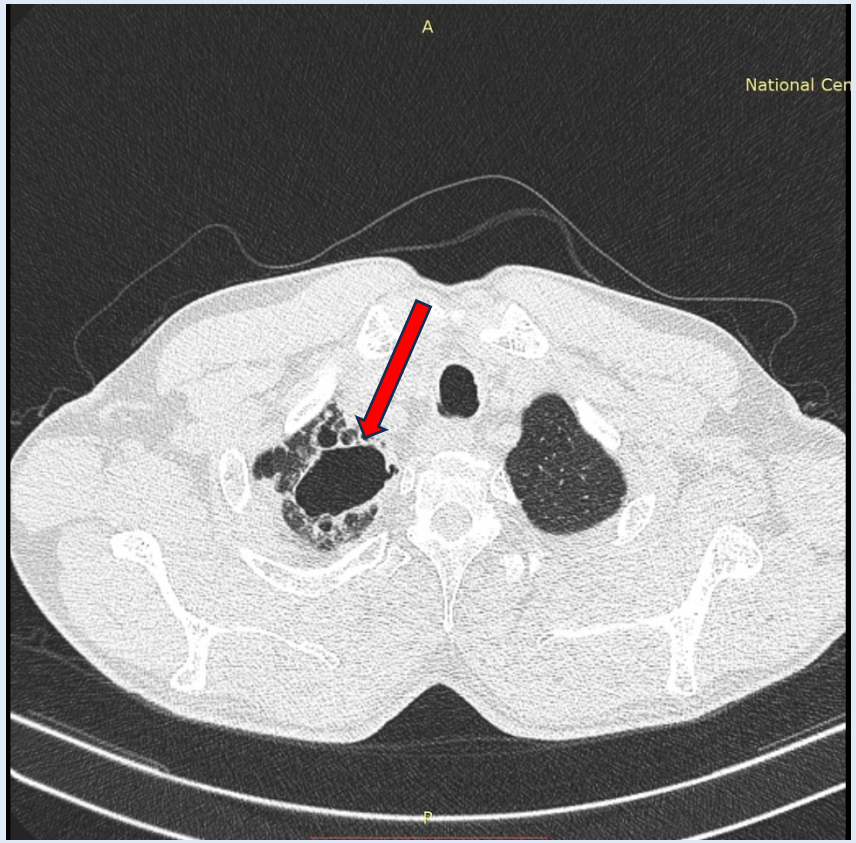


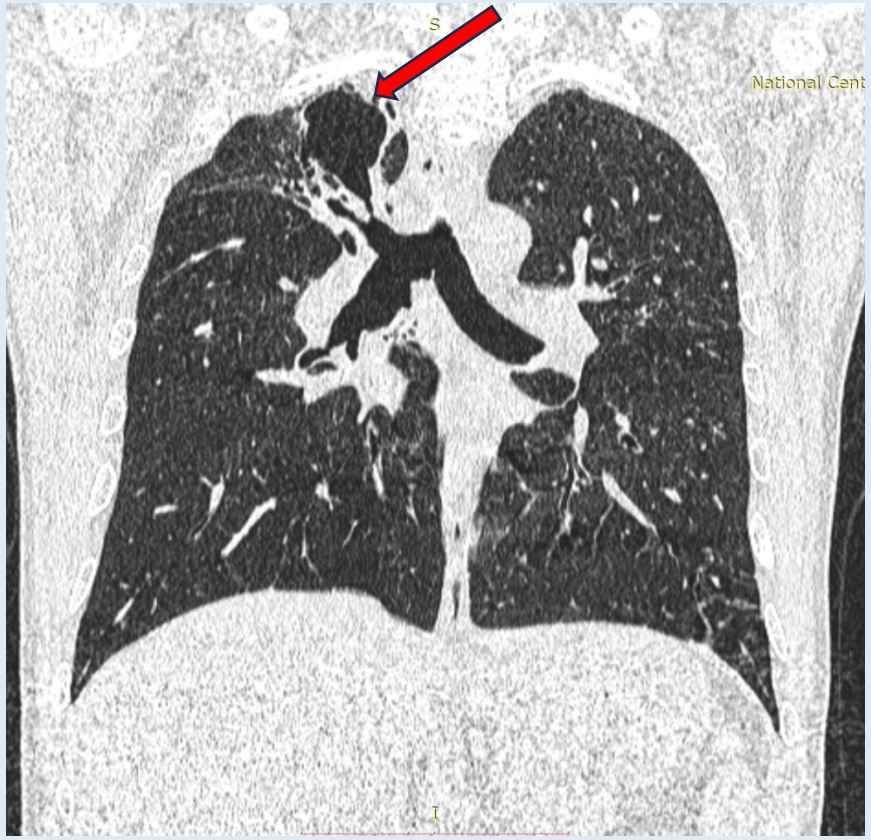




Chest CT scan after treatment

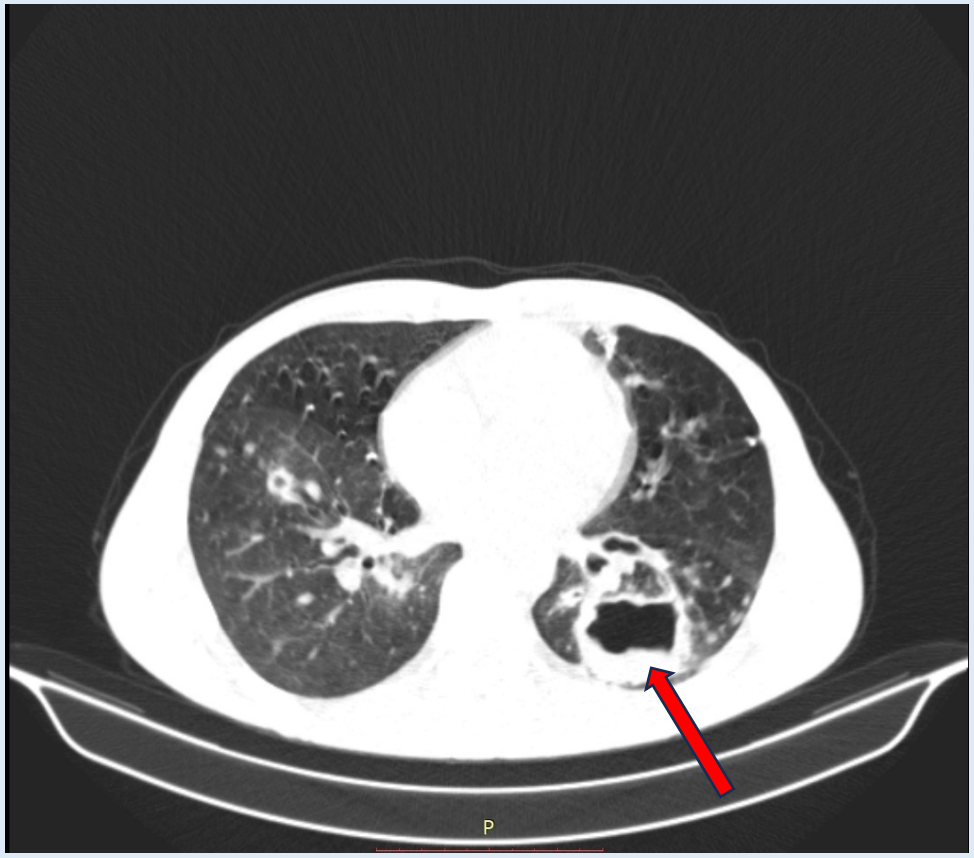
Case N1

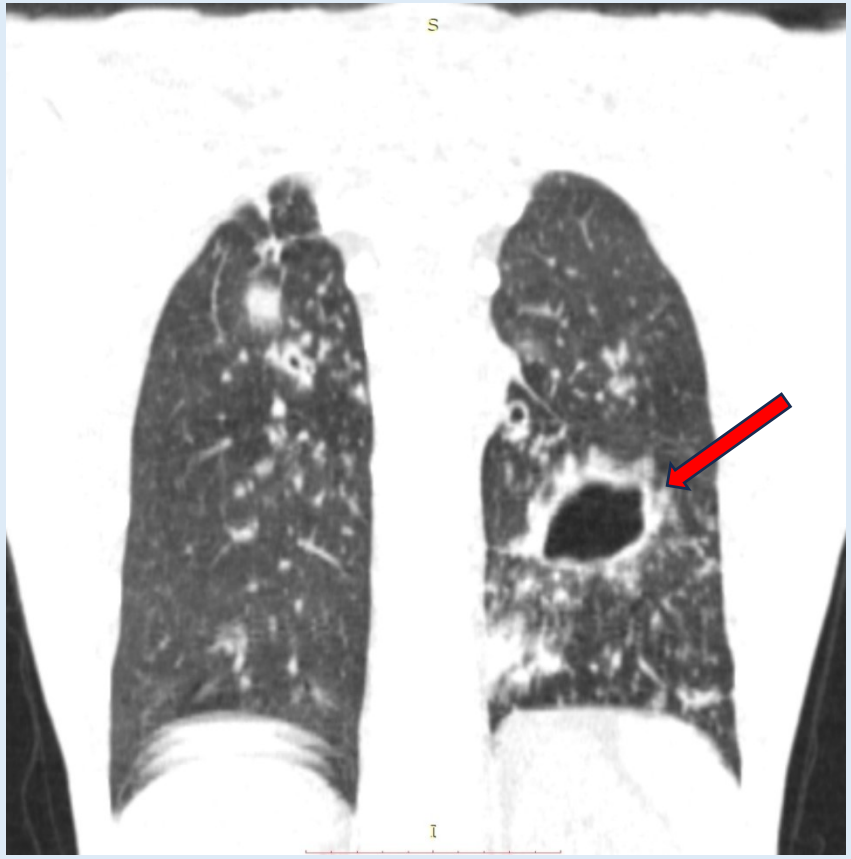




Chest CT scan 2.5 years after treatment

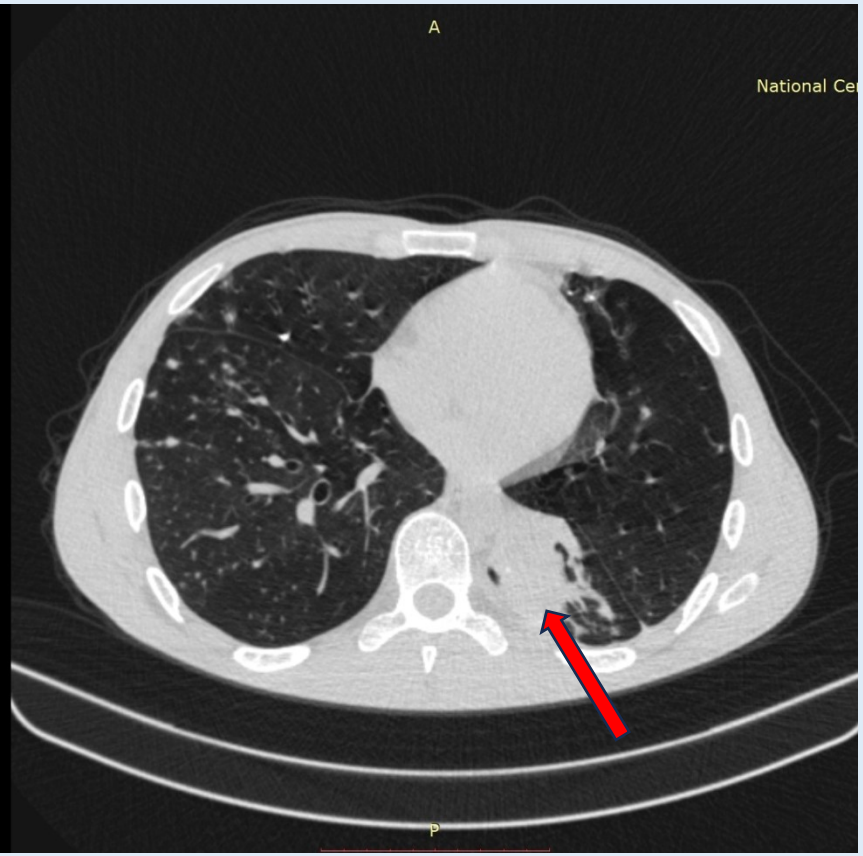
Case N2

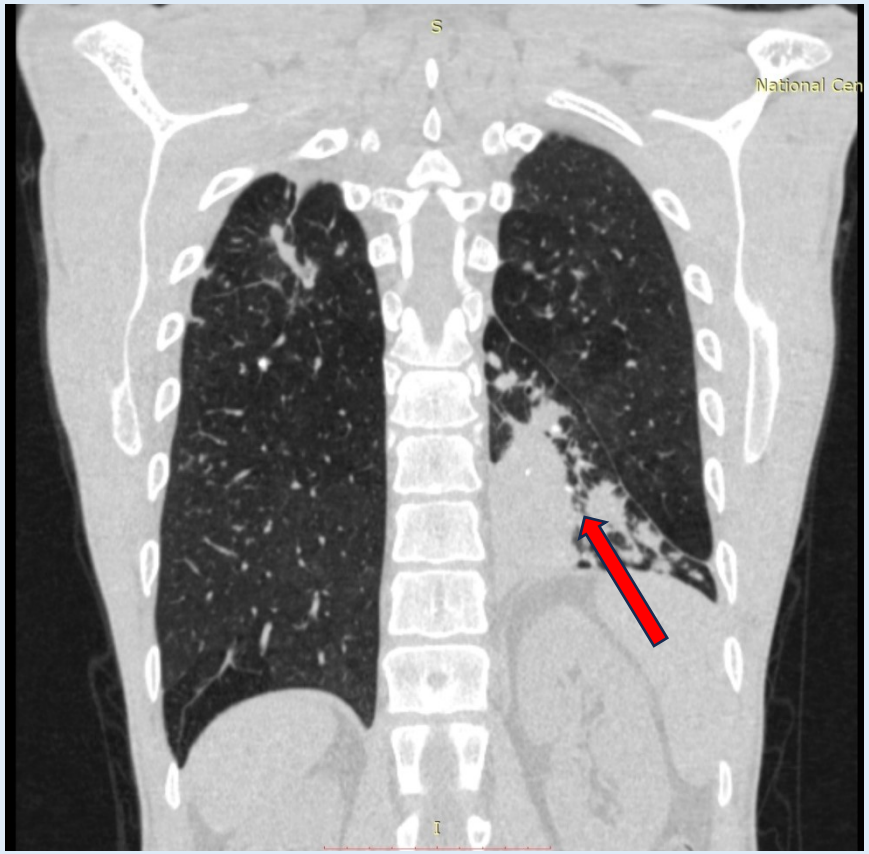


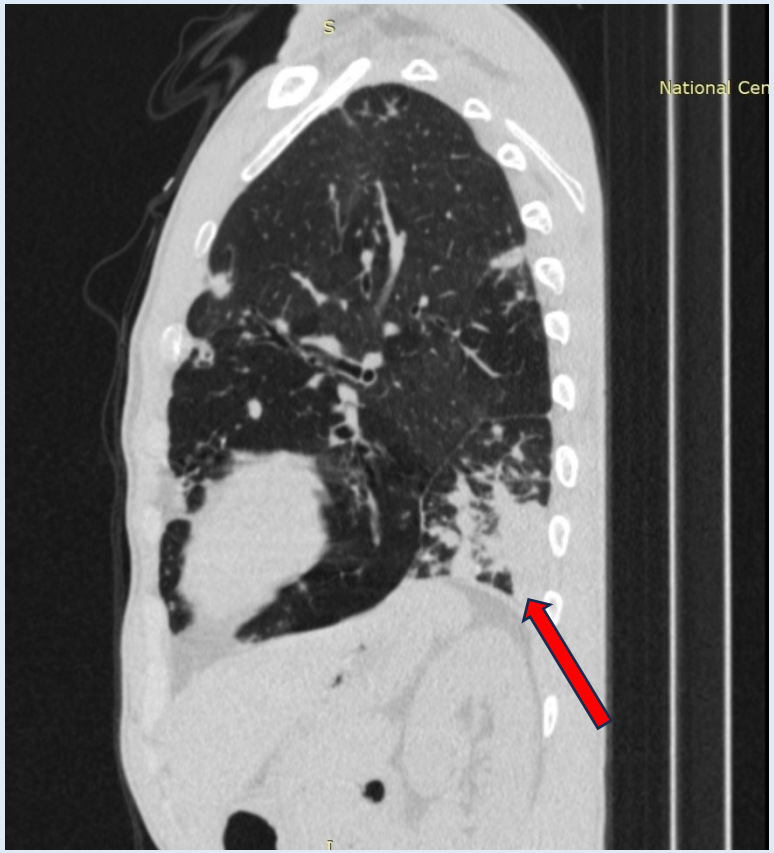


Chest CT scan before valvular broncho blocation

Case N2

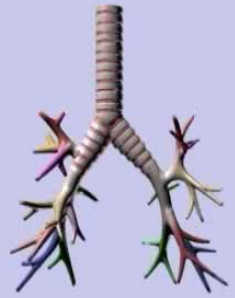






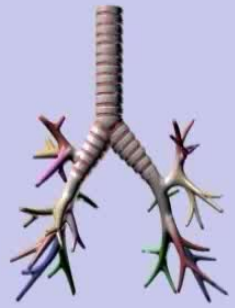
Chest CT scan 6 month after treatment

CONCLUSIONS



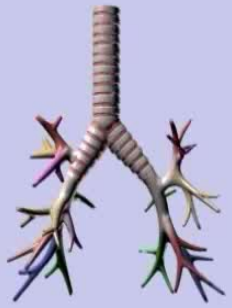
- Based on observation and statistical analysis of the dynamics of radiological data, a significant reduction in cavitary changes has been identified in the main group.
- On the basis of observation and statistical analysis of sputum bacterioscopic and cultural examinations, a significant decrease in contamination and conversion of culture has been demonstrated.
- From the parameters of general blood analysis, liver enzymes, bilirubin and kidney function indicators were not significantly changed in the study and control groups at the same stages of the study.
- The rate of post-intervention surgical intervention in the bronchoblockage subgroup of patients with ongoing tuberculosis and bleeding complications was significantly lower compared to the conservative therapy subgroup.There was also significantly less lethal outcome compared to the control group.
- Based on the dynamics of the above-mentioned radiological, bacterioscopic and cultural studies, valve bronchoblockage leads to the prevention of the consequences of tuberculosis.

PRACTICAL RECCOMENDATIONS



- Valvular bronchoblocation is considered as a less invasive and safer therapeutic method in the management of tuberculosis. Therefore, it's. widespread use is recommended in TB patients.
- The use of the valvular bronchoblocation is recommended to prepare patients for planned surgical interventions.
- In case of bleeding of any intensity, if conservative treatment is ineffective, valvular bronchoblocation is recommended.

The role of valvular bronchoblocation in the complex management of pulmonary tuberculosis



Thank you
for your attention…